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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/253,611	02/19/1999	PAUL A. FARRAR	303.572US1	5827

7590 02/13/2002

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EXAMINER

POMPEY, RON EVERETT

ART UNIT PAPER NUMBER

2812

DATE MAILED: 02/13/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/253,611

Applicant(s)

FARRAR, PAUL A.

Examiner

Ron E Pompey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-12,64,65,68 and 71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,64,65,68 and 71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC ' 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-12, 64, 65, 68 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cook et al. (US 5,457,345) in view of Thomas (US 4,661,375) and Strube et al. (US 4,650,548).

Cook disclose the steps of:

For claims 1, 3-12, 64, 65, 68 and 71:

forming a metal contact pad on a substrate (12, fig. 1);

forming an insulating layer on the metal contact pad (14, fig. 1);

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

depositing solder (46, fig. 4), wherein at least one material is selected from the group consisting of lead, tin and bismuth, on the exposed portion of the metal contact pad (44, fig. 4) using selective deposition, further comprises depositing solder on the exposed portion of the metal contact pad using a deposition process selected from the group consisting of immersion contact, chemical vapor deposition and electrolytic deposition, thereby forming a solder contact (col. 5, Ins. 1-10 and 37-49); and

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annealing the solder contact to form a solder ball contact (col. 1, Ins. 36-44), having a diameter in a range of about 2.5 microns to no greater than 100 microns(col. 2, Ins. 1-5).

3. Cook fails to disclose some or all the limitations of claims 1 and 8-12. However, Thomas discloses the steps of:

For claims 1 and 9-12:

deposition of the solder by immersion.

Strube discloses the steps of:

For claims 1 and 9-12:

electrolytically depositing solder on the exposed portion of the metal contact pad.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the steps disclosed by Strube in Cook, because said immersion and electrolytically deposition methods are conventional ways to deposit a solder.

4. For claims 1, 8-12 and 71:

further comprises forming an exposed portion of the metal contact pad having a diameter specific diameter;

wherein the insulating layer has a thickness of approximately 1.5 microns; and

wherein the layer of tin has a thickness of approximately 1.42 microns, further wherein the layer of lead and the layer of tin form a solder contact having a thickness of approximately 2.33 microns.

The examiner takes official notice that it is well known in the art and therefore, *prima facie* obvious to incorporate the above limitations in Cook or Thomas and Strube, because they are conventional thicknesses, diameters and deposition process. Due to the request by the applicant to verify that these limitations are well known Mohsen, 112 or 111, Fig. 1f, column 5, lines 50-65, disclose insulating layer of thickness 1.5 microns and via that is about 1-2 micron.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The applicant in claim 1 line 7, states "immersing the substrate in molten solder;" and on line 9, states "chemical vapor deposition or selective electrolytic deposition...". The examiner is confused as to which method of deposition the applicant is using or if both methods are being used.

Response to Arguments


5. Applicant's arguments filed 1-31-02, pertaining to claims 1, 3-12, 64, 65, 68 and 71, have been fully considered but they are not persuasive.


Applicant argues, pages 5, that Cook does teach or suggest a removable photo-resist lift-off mask and non-selective deposition. However the photo resist lift-off mask

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for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


Ron Pompey
Art Unit: 2812
February 11, 2002


John F. Niebling
Supervisory Patent Examiner
Technology Center 2800



Creation date: 01-15-2004
Indexing Officer: AJENKINS2 - ASHUNTA JENKINS
Team: OIPEBackFileIndexing
Dossier: 09253611

Legal Date: 05-28-2002

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Remarks:

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